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ABSTRACT

A study was conducted to examine social behavior by one-year-old boys over the course of a three-month playgroup experience. The "clusters" chosen for examination consisted of temporary groups (often less than a minute) the toddlers formed to focus on a single activity. Socially directed behavior is defined here as vocalizing, laughing and manipulating a toy while looking at another child. The five Ss ranged in age from 13 to 15 months at the first session. The playgroup met for about 2 1/2 hours each Monday and Friday in a room containing a variety of toys and play equipment, with parental supervision. The playgroup was videotaped for one hour each Friday morning. Behavior was analyzed by locating all clusters on the videotapes, coding their duration, participation, and then searching each cluster for measures of social intent. Results showed that: (1) clusters did not vary significantly across months in frequency, duration or number of children participating; (2) type of play activity did not relate to month or cluster duration; (3) despite a significant increase in clusters forming about inactive children, those forming around active children remained in the majority in month 3; (4) vocalizations and toy manipulations did not increase as expected; they were frequent even during the first month; and (5) the extent and complexity of social behavior increased during the three-month period. (KM)

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APPENDIX 2

CLUSTERING AND SOCIALLY-DIRECTED BEHAVIORS IN A PLAYGROUP OF ONE-YEAR-OLDS *

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CLUSTERING AND SOCIALLY-DIRECTED BEHAVIORS IN A PLAYGROUP OF ONE-YEAR-OLDS

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Before understanding of the early development of peer social interaction can progress very far, it is necessary to have a descriptive information on the first contacts between peers. It is also necessary to be able to assess when children act socially - that is, to produce behavior for its effect on other children and not merely for the pleasure of the action itself.

While Blurton Jones (1971) considers the second year of life as the most exciting year of childhood, he also recognizes it as the least known. Piaget's (1926) research suggested that children were incapable of developing much social interaction before the age of four or five. Maudry and Nekula's (1939) found fighting to be the dominant social activity of one-year-olds. However, recently, the absence of early social contacts or their primarily negativistic character has been disputed both for one-year-olds (Kennedy & Mueller, 1972; Vincze, 1971) and for older preschool children (Mueller, 1972). Indeed these studies, together with Bridges (1933), suggest that the second year of life is the ideal time to observe the emergence of peer interaction. Thus, while Vincze's infants were placed together regularly from the age of four months, no social exchange emerged before ten months. However, existing studies do not document early contacts between more than two children, nor does previous work go very far in objectifying what behavior leads observers to conclude that children become increasingly social in orientation during the second year.

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The purpose of this study is to examine social behavior by one-year-old boys over the course of a three-month playgroup experience. From the first session of the playgroup, the toddlers repeatedly came together and focused

on single activities. These group contacts, often less than one minute in duration, were called "clusters". Since they always included three or more children, clusters had high potential for the display of social behaviors; thus, they were chosen for detailed examination in this study.

In order to illustrate clusters, and the socially-directed behaviors that occurred during them, two contrasting examples are presented. The first, taken from an early playgroup session, is thought to be typical of early clusters. The second, from a concluding session, is thought to be typical of more socially advanced clusters. The first cluster centers around a toy train which has a bulb that can be squeezed to produce the noise of a train whistle. The children were 13-15 months old.

> A child toddles over to the train, squats down and makes the whistle sound repeatedly. All four other children in the room immediately toddle over, seemingly attracted by the sound of the whistle. The initial child makes no acknowledgement of their arrival, continuing to focus, instead, on the train. The newcomers commence manipulating the bulb in the same fashion as the initiating child, but they do not seem very interested in each other, focusing instead on the train. In addition, when one child does glance at another, his look goes unheeded by the child being watched. With the exception of two brief vocalizations produced while a child is looking <u>at the train</u>, there is almost no noise in the room. They never smile or laugh during the cluster. As their interest in the interaction with the train wanes, the children toddle off one by one. The cluster lasts 40 seconds.

Typical of "object-centered" clusters, this one began around a child actively engaged with play material. While the other children were attracted by the

display created, and were fully capable of imitating the novel actions they witnessed (Piaget, 1951), they did not coordinate their play with one another. In fact, they seemed to understand so little about their peers that they spent little time watching them. Even when they did look at their peers, they did not vocalize or smile toward them.

The second example of a cluster occured about three months and 20 playgroup sessions later:

> A child is leaning on a filing cabinet, not doing much of anything. Yet his mere presence attracts another child, who brings a small toy with him. The second child offers his toy to the first. Notice that the act of offering involves both holding out an object and simultaneously looking at another child. After having received the toy the first child smiles at the other child, not at the toy. They continue passing the toy back and forth several more times, often accompanying their social looks with vocalizations. At times an offering movement, a vocalization and social looking all occur simultaneously. A third child has joined the pair and two children now imitate a third one, who is pounding the toy on the cabinet. The imitators are not simply interested in reproducing the action since they also smile at the child with the toy. He laughs in return. A fourth child joins the others and vocalizes toward the first child. The first child gives him the toy, and the newcomer walks away with it. From the arrival of the third child, the cluster lasts 40 seconds.

The second cluster contrasts with the first both in formation and in amount and complexity of socially-directed behavior. In the first, a child was actively playing with toys <u>before</u> other children approached and imitated

his actions. In the second, a child was doing nothing but was still approached and offered a toy. In the first cluster, the children looked at each other only occasionally. In the second, social looking was frequent and indicated the social character of other behavior which occured simultaneously. For example, when the children vocalized, they were not talking to themselves; they looked at other children as they vocalized. They smiled and laughed at other children; they manipulated toys not only to explore them, but also to offer them to their peers and see if their peers were attending to their play. Finally the second cluster included one instance where several socially-directed behaviors were coordinated in a single action. While looking at another child, a toddler both offered a toy and vocalized.

Socially-directed behavior is defined here as vocalizing, laughing and manipulating a toy while looking at another child. When appearing without social attention, one cannot determine the social character of these behaviors. A toddler may smile at recognizing a familiar toy. He may vocalize repeatedly for the pleasure of hearing his own production repeated (Piaget, 1926). By contrast, when these behaviors occur simultaneously with social attention, they take on a social character. Bronson (1972) also observing one-year-olds, arrived at a similar definition of "social contacts".

By itself, visual attention to another child could have been considered as a socially-directed act. However, the focus in this research is on behaviors which may have social consequences. Laughing, vocalizing, or moving a toy may attract the attention of another child or establish a contingency between the action of one child and that of another. Social attention alone does not produce these effects and therefore appears to be of less importance in the genesis of social exchanges. However, it should be clear that this research does not assess the extent of responsiveness

by one child to the social acts of another. It is suspected that coordinated exchanges between toddlers emerge between specific dyads. Many of these exchanges occur outside of cluster situations, and thus will require separate analysis.

Method

Subjects. The subjects were five first-born males. All but one were the children of graduate students or professors. At the first session they ranged in age from 13 to 15 months. Some pairs of children had played together regularly prior to the first session.

Procedures. The playgroup met for about 2 1/2 hours each Monday and Friday morning for three months. The parents rotated the task of supervising the playgroup. The room was 16 feet by 40 feet; it contained a variety of toys and play equipment. Often the parent-in-charge would bring materials for special activities such as finger paint or dress-up clothes. However even during these special activities, there was little attempt to guide the children's play.

The playgroup was videotaped for one hour each Friday morning beginning at about ten o'clock. It was important to tape before the children became tired and were given their eleven o'clock snack, a very adult-oriented situation. The camera was in the room and was operated only by adults familiar to the children. At this age, but not at age two, the children pay no attention to the camera after discovering they cannot gain access to it.

Method of data analysis. In overview the initial plan was to locate all clusters on the videotapes and code their duration, participation, antecedent conditions and then search each cluster for measures of social intent. This plan was carried out except for the coding of antecedents. It was planned to distinguish various attention-capturing stimuli that might be differentially effective in starting clusters. In fact there were almost always multiple

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stimuli and it could not be determined whether the noise of the train or its movement was the effective stimulus. Also after several children were present, it was difficult to tell whether additional children were attracted by the continuing object play or by collection of children, an interesting display in itself!

Clusters were operationally defined as periods of 10 seconds or more where three or more children focused their attention on a single object or activity. Since one of the purposes of this research was to demonstrate that one-year-olds spontaneously cluster with each other, any adult-initiated gatherings were excluded. Notice that clusters are not defined in terms of distance between the children. While clustering usually did imply that the toddlers were spatially close together, there were instances where all the children were engaged with the same activity although widely separated. For example, once they all banged on the baseboard heating grate which extended the entire length of the room.

After a cluster was located, its total duration was recorded. Timing began as soon as the third child arrived and terminated when a child's departure left only two remaining. The size of each cluster was recorded as well as the total number of children present in the room at the time. The child about whom the cluster formed was coded either as active or inactive. An inactive child was one who, for example, merely sat on top of the slide but who did not climb its stairs or slide down during the time the cluster was forming. In addition, each child joining the first child was coded as either "active" or "observer" depending on whether he participated in the play or merely watched. It was expected that the proportion of active children would increase across sessions. Another code classified the types of cluster play. Using this code it could be ascertained whether object-independent clusters such as mutual vocalization exchanges, or chasing and following clusters increased in frequency as the playgroup continued to meet

Finally, each cluster was scanned for socially-directed behaviors. Instant replay videotape proved particularly valuable in locating these fleeting behavioral events. Each behavior included visual attention to another child together with some other action:

(1) vocalization with looking

(2) smiling and/or laughing with looking

(3) manipulation with looking

The term manipulation referred to manipulation of an object or of another child as well as such activities as pounding on a table or stamping one's feet. Combinations of the above categories were recorded separately.

Coding reliability was checked on a single tape of one hour duration. The same six clusters were located by both coders. While clusters durations ranged over 60 seconds (14-74), differences between coders' estimates of cluster durations ranged over 6 seconds (1-7). There was 100% agreement on measures of cluster size, activity level and play type. Regarding socially-directed behaviors, the coders were in agreement that four of the clusters had either zero or one such behavior. There was only one disagreement, during a combined cluster duration of 114 seconds, later recognized as an error of omission. The remaining two clusters lasted 124 seconds and the coders agreed that they contained a total of 18 socially-directed behaviors. Simple inter-coder agreement on the specific behavioral categories was 74%. Most errors were ones of omission. For this reason, both coders examined <u>all</u> clusters rich in socially-directed behavior so that the data represent a combined effort to record an accurate representation.

Results

The eleven analyzed tapes yielded a total of 42 clusters. This represents one cluster for every fifteen minutes of tape. Yet portions of some tapes could not be coded since they included adult-directed activities. Therefore, the rate of clustering for these free play periods was somewhat higher.

Clusters did not vary significantly across months either with respect to frequency, duration or number of children participating (Table 1). While the average cluster lasted 43 seconds, a high degree of variability in cluster duration was reflected in a standard deviation of 25 seconds. Clusters tended to attract all children present in the room at the time. The modal pattern

[Insert Table 1 about here]

was for all children present to join (41%). Also, with all five children present, it was twice as likely that four would join a cluster than that only three would join (22% versus 12%).

Type of play activity did not relate to month or to cluster duration. Overall, 52% of the clusters focused on large "get on" or "pass through" type objects. Thirty-one percent centered on small manipulable toys. The remaining clusters centered jointly on objects and on non-object activities such as chasing and following or mutual vocalizing. However, during the period studied, no clusters were entirely centered on object-free activities. While imitative body movement and vocalization exchanges did occur between particular dyads, they did not form the basis of any of the 42 clusters.

Given this descriptive information, results bearing on cluster formation and socially-directed behaviors may be presented. Comparing across months, the ratio of active to inactive children was 7%, 17% and 44% ($\chi^2 = 5.99$, df=2; $p = .05$). Thus, despite a significant increase in clusters forming about inactive children, those forming around active children remained in the majority in Month 3. The number of clusters in which each individual child

was active was divided by the total number of clusters he attended. The resulting decimals ranged from .91 to .79. Thus if a child joined a cluster, he was much more likely to participate actively than to simply observe.

The rate of occurrence of each socially-directed behavior per minute of cluster time is shown in Table 2. LAUGHING AND/OR SMILING and the coordinated behavior VOCALIZES AND MANIPULATES showed the expected increment

[Insert Table 2 about here]

across months. There was almost no expression of positive affect while looking at another child during Month 1. After that about one instance of laughing or smiling occurred each minute, a ten-fold increase. The rate of vocalizing and manipulating a toy, while looking at another child, increased five-fold across the three month period. The remaining coordinated behaviors appeard only during Month 3 and even then remained infrequent. Finally, the sum of all socially-directed behaviors increased from 3.0 per minute in Month 1 to 6.0 per minute in Month 3.

Socially-directed vocalizations (VOCALIZES) and toy manipulations (MANIPULATES) did not increase as expected. In fact they were frequent even during the first month. Several possible explanations of this unexpected pattern will be considered.

It was thought that object-centered clusters would decrease across months while child-centered clusters would increase. Considering all 42 clusters, roughly one third can be considered "object-centered" since they contained no more than one socially-directed behavior. Another third were "intermediate" (2-3 behaviors) and the final third was "socially-centered" (4-13 behaviors). However, the frequency of these categories did not differ significantly between months. Thus object-centered clusters

continued to be of frequent occurrence (44% in Month 3) throughout the period studied.

Was the presence of many socially-directed behaviors associated with clusters of long duration? The rank correlation across the three months were 0.16, 0.07 and 0.51. Only during Month 3 was this correlation significant ($p<.05$). During this month clusters lasting more than the mean of 40 seconds had one socially-directed behavior every seven seconds. Clusters lasting less than 40 seconds had one behavior every 35 seconds. Thus, the relationship was much greater than that expected assuming that social behaviors occurred at a constant rate regardless o cluster duration.

Discussion

From their first session together, one-year-olds were found to cluster together repeatedly. Early clusters invariably formed around the nucleus of a single child who was actively playing with some object. On the average, clusters were found to be of about one minute duration and were attended by nearly all the children in the playgroup. As such they represent one important mechanism, perhaps the single most important mechanism, bringing these one-year-olds into contact in a free play situation.

The extent and complexity of social behavior changed during the three month period that the playgroup met. However, before this progression can be summarized, it is necessary to explain why VOCALIZES and MANIPULATES were of frequent occurrence during the first month. One possibility was that these behaviors were not actually social. However, a re-examination of the clusters confirmed our belief in their social direction. The children were directing their vocalizations toward other children. When a child moved a curtain while watching another child, he did so because of the meaning of the curtain in the context of hide-and-seek, that is in the context of social

exchange. Another possibility was that the children had already acquired some skills for relating to each other before the first play session. This interpretation is supported by a video tape of two of the children made several weeks before the first playgroup session. There was evidence on this tape of socially-directed vocalization and offering. Clearly, further playgroup research should begin with younger children.

With this background, the progression across the three month period may be summarized. During Month 1, while some expressions of social behavior were present, the children did not yet coordinate different socially-directed behaviors in single acts. Also, there was almost no laughing or smiling directed at other children. Clustering occurred only about children who were actively playing with some object.

Month 2 clusters were similar to those of Month 1 except for a marked increase in positive affect accompanying watching other children's actions. Nevertheless, this may reflect a major increase in social understanding. Children may laugh because they recognize the contingency between their own actions and those of other children. They discover that peers, like toys, can be controlled through action. Mueller and De Stefano (1972) have observed that imitation exists in the playgroup from the first session. However, only after about one month of peer experience do the children become aware of these contingencies, and seek to reinstate them.

During Month 3, social behaviors appeared in combination. Children would look at a peer, vocalize, and manipulate a toy all at the same time. Also, for the first time a substantial proportion of clusters formed around inactive children. For example, the very presence of a child on top of the slide might attract another child and then, together, the pair would initiate coordinated sliding. Finally, only in Month 3 was frequency of socially-directed behaviors positively correlated with cluster duration.

All of these changes suggest, and informal observations of the tapes agree, that children were now coming together for the purpose of initiating exchanges with each other and not simply with toys. In Month 3, clusters appeared to be of long duration because of social interchanges which complemented, but never excluded, interaction with slides and tables and toy trains. Increasingly, the children came together to play the "walk-stamp on the table" game or the "hide behind the curtain" game and appeared to be primarily oriented toward the exchange rather than toward the objects which permitted the game to occur. However, one should not exaggerate the progress made. Object-centered clusters remained frequent during Month 3. Truly coordinated exchanges were limited to a small set of games and to particular pairs of children. While we have observed <u>two-year-olds</u> directing their social acts toward <u>two</u> other children at once, we never observed this skill among these one-year-olds.

Bronson (1972), also observing one-year-old interaction in playgroups and utilizing a similar conception of social acts, has reached the working hypothesis that the learning of interpersonal contingencies is very difficult to achieve at this age. However the composition of her playgroup varied from session to session and sessions were spaced roughly one month apart.

Observing a constant group of children meeting twice a week, this study arrives at the opposite conclusion: that considerable interpersonal orientation and skill can be developed before age eighteen months in a free play situation. However, since these children showed some social orientation and skill toward their peers from the first session, future studies might begin with younger children and include no-playgroup controls to differentiate the effects of the playgroup from other developmental progress in the genesis of socially-directed behaviors.

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Footnote

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TABLE 1

Cluster Properties by Month

	Number of clusters located	Clusters per hour	Mean duration (in seconds)	Mean number of children	Participation ratio[1]
Month 1	14	3.5	53	3.6	.85
Month 2	12	4.0	35	3.4	.83
Month 3	16	4.0	42	3.4	.85
Total period	42	3.8	43	3.5	.85
Analysis of variance for months	--	Data approximate	n.s.	n.s.	n.s

[1]Ranged from 0.6 when a cluster contained 3 of 5 possible children to 1.0 when all children present entered cluster.

TABLE 2

Rates of Social Behaviors by Month

Expressed in Occurrences per Minute of Cluster Time

	Month 1	Month 2	Month 3
Simple behaviors			
LOOKS AND			
VOCALIZES	1.2	2.6	0.6
LAUGHS (and/or smiles)	0.1	1.6	1.0
MANIPULATES	1.5	1.0	3.0
Coordinated behaviors			
LOOKS,			
VOCALIZES AND LAUGHS	0	0	0.1
VOCALIZES AND MANIPULATES	0.2	0.4	1.0
LAUGHS AND MANIPULATES	0	0	0.1
VOCALIZES, LAUGHS AND MANIPULATES	0	0	0.1
Total -- all categories	3.0	5.6	6.0